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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,387	11/19/2001	Paul Van Der Veen	P 284021 P-0217.010-US	8241

909 7590 04/10/2003

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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/988,387

Applicant(s)

VAN DER VEEN, PAUL

Examiner

Phillip A Johnston

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Claims Rejection – 35 U.S.C. 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,369,398 to Gelernt, in view of Partlo, U.S. Patent App. Pub. No. 2002/0105994, and in further view of Suzuki, U.S. Patent App. Pub. No. 2002/0020220.

Regarding Claims 1-8, Gelernt (398) discloses a lithographic system used in the fabrication of integrated circuits (IC). A source of radiation 110 exposes a radiation sensitive material 160, known as a resist that has been coated on the substrate surface 180. The resist 160 is typically a polymeric material, which undergoes structural or chemical changes upon exposure to the incident radiation. The incident radiation, which is typically of narrow bandwidth, is either provided by conventional light sources such as a mercury lamp, or excimer laser systems such as krypton

Art Unit: 2881

fluoride (KrF) or argon fluoride (ArF). For example, the bandwidth of the incident radiation may be controlled by the use of an appropriate filter 115. A mask 130, or reticle, is positioned between the light source 110 and the substrate 180 containing the resist layer 160. A typical optical imaging system for photolithography comprises a lens component 120 used to collimate the light, or radiation, to illuminate the mask 130. The light which is transmitted through the mask 130 is subsequently focused by additional imaging optics 140 onto the resist layer 160. The mask 130 contains regions such as 130a that transmit the radiation and regions 130b that block the radiation. A typical mask, for example, consists of a chrome pattern (corresponding to a circuit pattern) that has been formed over a quartz substrate 132. While quartz is transparent to the incident radiation, the chrome pattern prevents the radiation from reaching the resist layer 160. For example, this lithographic exposure step may render the exposed resist region soluble to a chemical in a subsequent developing step, and allows the circuit pattern to be transferred to the resist layer. See Column 1, line 31-59.

Gelernt (398) as applied above does not disclose the use of an acoustic sensor to detect sounds caused by the passage of pulses of radiation of the projection system, as recited in Claim 1. However, Partlo (994) discloses a gas discharge laser for lithography, that utilizes a purge contamination detection system. This detection system comprises a small microphone such as an electret electronic microphone available from suppliers such as Audio Products with offices in Dayton, Ohio. The output of electret microphone is fed to a high impedance preamplifier. This

microphone detects acoustic waves created by any significant absorption of the laser beam passing through this confined chamber. Normally there will be no significant contamination in the purge flow and therefore no significant acoustic waves will be generated. However, any extremely minute quantity of any material (gas or otherwise) that absorbs any significant fraction of the laser pulse at 193 nm will produce an easily detected shock wave when illuminated by the short pulse (about 30 ns) of the laser. See page 6, paragraph [0089].

Therefore it would have been obvious to one of ordinary skill in the art that Gelernt's (398) lithographic exposure system can be modified to use the acoustic detection apparatus and method in accordance with Partlo (994), to minimize contamination of the beam path of a laser lithographic radiation source.

Regarding Claim 5, Gelernt (398) in view of Partlo (994) discloses a lithographic exposure system that utilizes an acoustic sensor, but does not disclose the use of a vibration sensor. Suzuki (220); discloses that before processing a reticle for apertures, the internal stresses of its membranes are measured, and only reticles with the membranes whose internal stresses are within a permissible range are selected for use. The internal stresses of the membranes is measured by generating a sound having a certain frequency by a piezoelectric element, oscillating each membrane by the sound, detecting the amplitude of the vibration, finding out a resonance frequency of the membrane, and calculating the internal stress of the membrane based on the resonance frequency thus found. The amplitude of the vibration is detected by using

Art Unit: 2881

a light lever formed by a multi-segment photo detector and a laser such as a semiconductor laser. See page 1, paragraph [0009].

Therefore it would have been obvious to one of ordinary skill in the art that the lithographic of Gelernt (398) in view of Partlo (994) can be modified to use the vibration detection apparatus and method of Suzuki (220) to detect vibration on the substrate, if so desired.


Conclusion

3. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (703) 305-7022. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (703) 308-4116. The fax phone numbers are (703) 872-9318 for regular response activity, and (703) 872-9319 for after-final responses. In addition the customer service fax number is (703) 872- 9317.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ

April 4, 2003


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800